

What is Claimed Is:

- 1           1.       A method of improving uniformity of plasma etching, comprising the  
2 steps of:  
3                   etching a wafer with a free radical plasma;  
4                   exposing said wafer to infrared energy from an infrared energy source;  
5 and  
6                   attenuating said infrared energy in a predetermined pattern to reduce non-  
7 uniformities.
- 1           2.       The method of claim 1, wherein said infrared energy comprises resonant  
2 infrared energy.
- 1           3.       The method of claim 2, wherein said step of attenuating said infrared  
2 energy in a predetermined pattern to reduce non-uniformities comprises positioning a  
3 filter having a predetermined pattern of variable transmittance regions between said  
4 infrared energy source and said wafer.
- 1           4.       The method of claim 3, wherein said predetermined pattern of said filter  
2 comprises an outer perimeter having a first transmittance and a center portion having a  
3 second transmittance.
- 1           5.       The method of claim 4, wherein said first transmittance is lower than said  
2 second transmittance.

1           6.       The method of claim 3, wherein said predetermined pattern of said filter  
2 comprises a series of eccentric regions of gradually decreased transmittance.

1           7.       The method of claim 3, wherein said predetermined pattern of said filter  
2 comprises a first region having a first transmittance and a plurality of second regions  
3 having a second transmittance.

1           8.       The method of claim 1, further comprising the step of filtering said  
2 infrared energy to have a resonant frequency.

1           9.       The method of claim 8, wherein the steps of filtering said infrared energy  
2 to have a resonant frequency and attenuating said infrared energy in a predetermined  
3 pattern to reduce non-uniformities comprise positioning a filter between said infrared  
4 energy source and said wafer.

1           10.      The method of claim 8, wherein the steps of filtering said infrared energy  
2 to have a resonant frequency and attenuating said infrared energy in a predetermined  
3 pattern to reduce non-uniformities are performed by a single filter.

1           11.      A filter for reducing non-uniformities in a plasma etching process,  
2 comprising:  
3                   a first region having a first transmittance; and  
4                   a second region having second transmittance that is different than said  
5 first transmittance level.

- 1           12.     The filter of claim 11, wherein said first region comprises a perimeter of  
2     said filter and said second region comprises a center portion of said filter.
- 1           13.     The filter of claim 12, wherein said first transmittance is lower than said  
2     second transmittance.
- 1           14.     The filter of claim 11, wherein said first region and said second region are  
2     eccentric.
- 1           15.     The filter of claim 11, wherein said second region is positioned to reduce  
2     transmission in areas where said plasma etching process experiences magnetic field  
3     cusping.
- 1           16.     The filter of claim 11, wherein said filter comprises optical quality glass  
2     having a layer of metallic coating of a predetermined thickness.
- 1           17.     The filter of claim 11, wherein the thickness of said layer of metallic  
2     coating varies to form said first and said second regions.